

REMARKS

35 U.S.C. 112

The examiner rejected claims 1 and 8-11 under 35 U.S.C. 112, second paragraph, as allegedly being indefinite. The examiner states:

Claims 1 and 8-11 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the amendment filed 12/13/10 applicants amended claim 1 to recite that the "resistive heating element disposed in the fuel egress port configured to produce heat and provide a concomitant increase in a vaporization rate of fuel from the housing". It is unclear how the resistive heating element is "configured" to both produce heat as well as provide a concomitant increase in a vaporization rate of fuel from the housing. It is clear that a resistive heating element produces heat because that is what they are structurally designed to do. However it is not clear how a resistive heating element can provide a concomitant increase in vaporization rate of fuel from the housing via its simplistic structure.

Without conceding to the Examiner's position, Applicant has amended independent claim 1 to recite "a resistive heating element ... configured to produce heat, the heat providing a concomitant increase in a vaporization rate of the fuel as the vapor from the housing." Applicant believes that the foregoing amendments to the independent claim 1 overcome the rejection under 35 U.S.C. 112, second paragraph.

35 U.S.C. 102

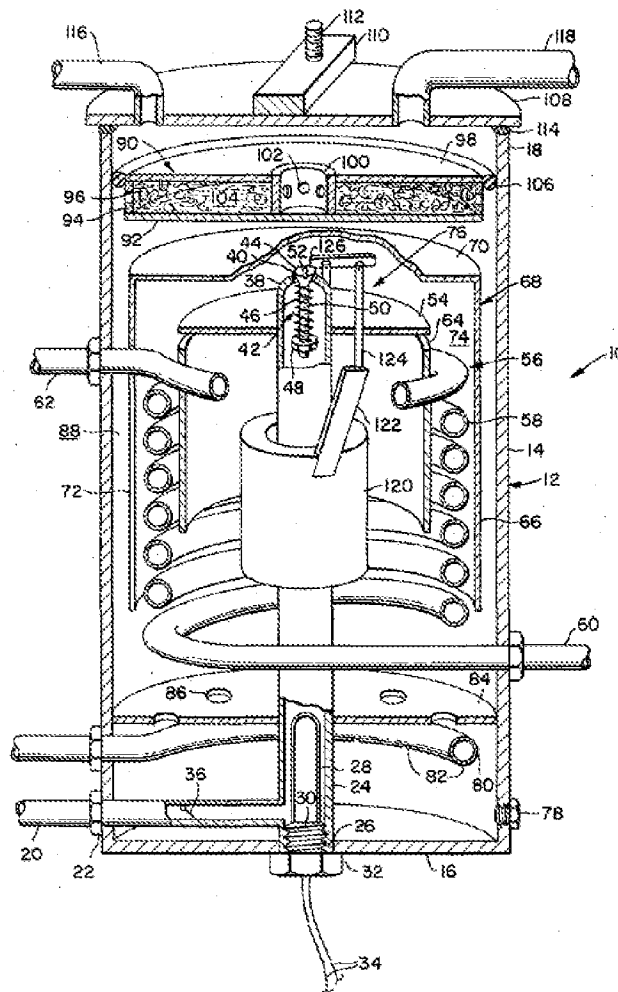
The examiner rejected claims 1 and 8-11 under 35 U.S.C. 102(b), as allegedly anticipated by U.S. Patent No. 4,338,907 ("Lindbeck"). The examiner states:

As seen in figure 1, Lindbeck teaches a fuel cartridge 10 comprising a housing 12, defining an interior space which confines liquid oxidizable fuel (column 4, line 37- column 5, line 12), a fuel egress port 24 supported by the housing, which provides egress of fuel from the interior space of the housing to an annular space of the housing, and a resistive heating element 28 disposed in the fuel egress port, wherein the resistive heating element is a wire that is disposed in thermal communication with the interior of the cartridge and it spaces a vapor portion of the cartridge (column 3, line 26 - column 4, line 9).

Without conceding to the examiner's position, Applicant has amended claim 1 to recite, *inter alia*, "the fuel egress port providing egress of fuel ... as a vapor, with the vapor *exiting the housing* through the fuel egress port." Support for the foregoing amendment can be found at least in FIG. 4A and the accompanying description in Applicant's specification.

Lindbeck does not describe the foregoing feature of amended claim 1. Figure 1 from Lindbeck is reproduced below:

FIG. 1.



The examiner seems to construe a pipe connected to a fuel inlet (referred to in Lindbeck as the liquid fuel riser 24) as an "egress port." However, even under the construction set forth by the examiner (which Applicant does not concede to be accurate), Lindbeck does not describe the foregoing feature of amended claim 1. Lindbeck only describes that the fuel moves from a fuel

riser portion of the housing to another portion (that the examiner describes as “**an annular space**”) of the same housing through the alleged egress port. In the examiner's own words¹, “**Lindbeck explicitly discloses that the fuel egresses from the interior space of the housing to an annular space of the housing.**” Therefore, Lindbeck fails to describe that “a fuel egress port ... providing egress of fuel ... as a vapor...the vapor *exiting the housing* through the fuel egress port,” as recited in amended claim 1. Claim 1 is therefore patentable over Lindbeck for at least the foregoing reasons.

Claims 8-11 are patentable for at least the reasons for which claim 1 is patentable.

The examiner also rejected claims 1 and 8-11 under 35 U.S.C. 102(b), as allegedly anticipated by U.S. Patent No. 4,684,786 (“Mann”). The examiner states:

As seen in the figures 1, Mann teaches a fuel cartridge 12 comprising a housing 17, defining an interior space which confines liquid oxidizable fuel, a fuel egress port 22 or 40 supported by the housing, which provides egress of fuel from the interior space of the housing to an external space of the housing (i.e. the fuel exits the housing), and a resistive heating element 26 or 70 disposed in the fuel egress port, wherein the resistive heating element is a wire that is disposed in thermal communication with the interior of the cartridge and it spaces a vapor portion of the cartridge (i.e. head space) (whole document).

Without conceding to the examiner's position, Applicant has amended claim 1 to recite, *inter alia*, “a resistive heating element disposed in the housing and in proximity to the fuel egress port ... with the cartridge having the fuel egress port configured to attach to a fuel cell to deliver an oxidizable vapor to the fuel cell.” Mann does not describe at least the foregoing feature of amended claim 1. In contrast, what the examiner construes as a fuel cartridge is a fuel tank of a motor vehicle. Further, Mann describes a fuel pick-up assembly that is insertable in a motor vehicle fuel tank for defrosting and dewaxing of fuel. Nothing in Mann describes or even suggests that the fuel pick up assembly of Mann provides “egress of fuel from the interior space of the housing as a vapor,” as recited in claim 1. Claim 1 is therefore patentable over Mann for at least the foregoing reasons.

Claims 8-11 are patentable for at least the reasons for which claim 1 is patentable.

¹ Office Action dated 2/2/2011, page 3.

35 U.S.C. 103(a)

The examiner rejected claim 8 as allegedly being unpatentable over Lindbeck and further in view of U.S. Published Application 2005/0031522 ("Delaney"). The examiner also rejected claim 8 as allegedly unpatentable over Mann and Delaney. The examiner states:

Assuming *arguendo* that patentable weight is given to the intended use and the material worked upon in claim 8, Lindbeck teaches that the liquid fuel in the fuel cartridge is vaporized and the liquid fuel can be a hydrocarbon such as gasoline (see citations above).

Delaney teaches that hydrocarbon direct fuel cells use methanol, ethanol, diesel and/or gasoline as fuel.

...

Assuming *arguendo* that patentable weight is given to the intended use and the material worked upon in claim 8, Mann teaches that the liquid fuel in the fuel cartridge is can be a hydrocarbon such as diesel (see citations above).

Delaney teaches that hydrocarbon direct fuel cells use methanol, ethanol, diesel and/or gasoline as fuel.

Claim 8 properly depends from claim 1 and is therefore patentable for at least the reasons for which claim 1 is patentable. Delaney, which is directed to a method for simultaneously producing oxygen and absorbing carbon dioxide, fails to suggest, much less describe, the features missing in Lindbeck and Mann and therefore fails to detract from the patentability of claim 8.

The examiner rejected claims 12, 14, 16 and 17 as being allegedly unpatentable over U.S. patent 6,506,513 ("Yonetsu") in view of GB 2,263,501 ("Tsoi-Hei").

The examiner also rejected claim 15 under 35 USC 103(a) as being allegedly unpatentable over Yonetsu in view of Tsoi-Hei and further in view of Gore.

With respect to claim 12, the examiner states:

As seen in the figures, Yonetsu teaches a fuel cartridge, that is prismatic in shape, having a housing 1, a fuel egress port 3 that contains a heat producing element "a" (i.e. porous carbon vaporizing plate, Figure 2, column 13, lines 16-20),

Furthermore in column 4, line 50 Yonetsu clearly discloses that the pathway 3 is filled with a porous material through which the liquid fuel permeates (also called a fine tube that performs capillary function as admitted to by Applicants in the Remarks filed 11/4/09) and the porous material is in fluid communication and fluidly connected to the liquid fuel holding material called a receiver 5, where the fuel is vaporized before

entering the unit cell. Therefore the entire path that the fuel flows through before it is vaporized at the vaporization plate "a" is considered the "egress port" and since the receiver 5 is completely disposed on the vaporization plate "a" the vaporization plate "a" is disposed in the path of the fuel being supplied and is therefore "disposed in the fuel egress port" as recited in instant claim 1.

...

Yonetsu does not teach that the porous carbon vaporization plate is a resistive heating element. Tsoi-Hei teaches a porous carbon heating element 22 (i.e. resistive heating element) that is connected to two electrodes 18a and 18b, which supply the porous carbon heating element electrical current that causes the porous carbon heating element to produce heat and to vaporize liquid fuel that is supplied to the porous carbon heating element (page 4, line 26 - page 5, line 6 and page 6, lines 6-30). (Emphasis Added)

Further, in response to Applicant's arguments filed on 12/13/2010, the examiner states:

Applicants further state that Yonetsu teaches away from the addition of the resistive heating element because Yonetsu supposedly only provides a vapor phase in the unit cell of the stacked body (of the fuel cell) and not in the cartridge. It is unclear what applicants are referring to as the cartridge. In the grounds of rejection applicants were referred to figures 13-14B as showing the interior of the cartridge. As seen in these figures everything is a single solitary whole unit and therefore the entire device is considered a cartridge given the broadest most reasonable interpretation of the instant claim terms.

Without conceding to the examiner's position, Applicant has amended claim 12 to recite, *inter alia*, "a resistive heating element disposed in the housing and in proximity to the fuel egress port ... with the cartridge having the fuel egress port configured to attach to a fuel cell to deliver an oxidizable vapor to the fuel cell," further clarifying that the cartridge recited in Applicant's claims is a separate entity from a fuel cell.

The examiner admits that Yonetsu fails to teach the resistive heating element and relies on Tsoi-Hei for that teaching. However, Yonetsu would teach away from a heating element at least because Yonetsu does not appear to move fuel from the tank in a vapor phase. Rather, the vapor phase in Yonetsu is achieved in the unit cell of the stacked body (of the fuel cell) and not in "the cartridge having the fuel egress port configured to attach to a fuel cell to deliver an oxidizable vapor to the fuel cell," as recited in amended claim 12.

Claims 14, 15, 16, and 17 properly depend from claim 12 and are therefore patentable for at least the reasons for which claim 12 is patentable. Gore does not describe or suggest "a fuel

egress port... configured to pass fuel in vapor phase," and therefore fails to detract from the patentability of claim 15.

Double Patenting

The Examiner continues to reject claims 1, 8, 12 and 17 on the ground of non-statutory obviousness type double patenting as allegedly being unpatentable over claims 11 and 12 of co-pending application number 10/664,818. In this regard the examiner states:

Regarding the Obviousness type Double Patenting rejection, applicants' arguments are still not persuasive for all the reasons already made of record.

Applicant disagrees and maintains that the obviousness type double patenting rejection is improper for the reasons already made of record. In particular, Applicant maintains that the claims 11 and 12 of the '818 application do not prevent the practice of claims 1, 8, 12 and 17 of the present application or vice-versa at least because the claims of the '818 application are neither broader nor narrower than the claims of the instant case, but instead are directed to patentably distinct subject matter. As such, applicant contends that the double patenting rejection is improper and should be withdrawn.

Applicant considers this rejection inconsistent with the restriction made by the examiner in this application.

Claims 11 and 12 (as allowed) in the '818 application read as below:

11. (Currently Amended) A portable fuel cartridge that supplies a source of fuel to a fuel cell, the fuel cartridge comprising:

a housing, of vapor impermeable walls, the walls of the housing defining a fixed interior space to confine and to be in direct contact with a liquid source of an oxidizable fuel, the housing having walls that define the fixed interior space and having at least a portion of a first one of the walls of the housing comprised of a thermally conductive material with remaining walls of the housing comprising a thermally insulating material;

a surface area enhanced planar vaporization membrane residing in the cartridge; and

a fuel egress port member supported by a second, different one of the walls of the housing of the cartridge, the fuel egress port member providing an egress through the second, different one of the walls of the housing with the at least portion of the first wall of the housing sinking heat generated from external components to enhance a delivery rate of the liquid source of oxidizable fuel in a vapor phase to the egress port of the cartridge.

12. (Previously Presented) The fuel cartridge of claim 11 wherein the liquid is methanol and the fuel cell is a direct methanol fuel cell.

Neither of these claims recites either the heating element or the piston required by the claims in the instant application.

Applicant is concurrently filing a Request for Continued Examination (RCE).

The RCE fee in the amount of \$810 is being paid concurrently via the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to deposit account 06-1050 referencing attorney docket number 08935-0299001.

Respectfully submitted,

Date: May 4, 2011

/Denis G. Maloney/
Denis G. Maloney
Reg. No. 29,670

Customer Number 26161
Fish & Richardson P.C.
Telephone: (617) 542-5070
Facsimile: (877) 769-7945